

**URECON**  
PRE-INSULATED PIPE

**LOGSTOR**   
**flexible systems**



# Complete flexible systems for service and branch lines

Pex-Flex, CU-Flex and Steel-Flex pipes, combined with a complete range of fittings and joints create flexible, pre-insulated pipe systems. These systems are mainly used as service pipes in the district heating sector but can also be used in many other applications.

Pex-Flex has a PEX carrier pipe, intended for temperatures up to 203 °F (95 °C) and an operating pressure of 87 to 145 psi (6-10 bar) depending on the operating temperature. The PEX carrier pipe also features an oxygen diffusion barrier.

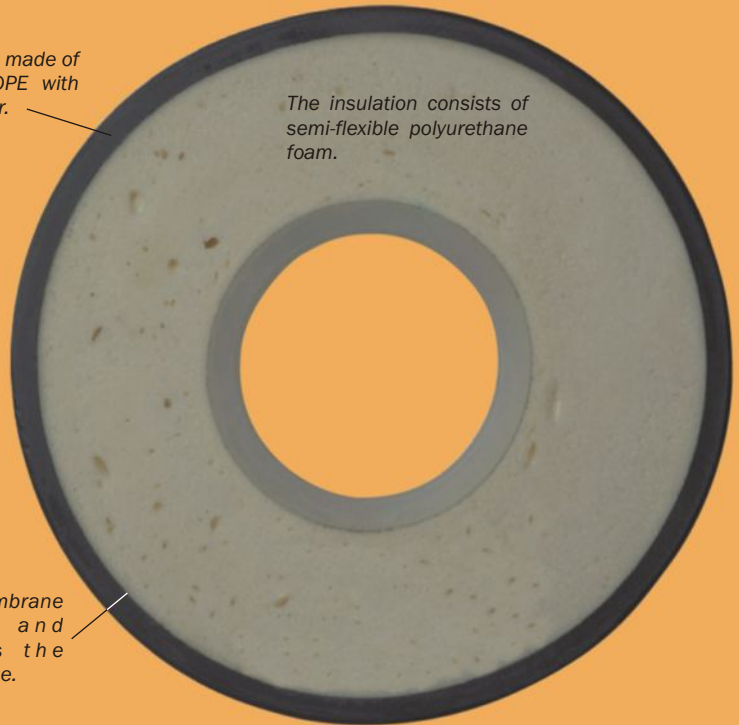
Cu-Flex has a carrier pipe made of soft annealed copper, intended for temperatures up to 266°F (130 °C) and a maximum operating pressure of 232 psi (16 bar).

Steel-Flex has a carrier pipe made of steel, intended for temperatures up to 266°F (130 °C) and a maximum operating pressure up to 362 psi (25 bar).

*The jacket is made of extruded LDPE with U.V. stabilizer.*

*The insulation consists of semi-flexible polyurethane foam.*

*"Smart" membrane enhances and maintains the insulation value.*



## Sturdy district heating pipes with a low thermal loss

Logstor's flexible pipe systems are all made according to the same principles. The semi-flexible polyurethane foam with its closed cells has a high insulation value, and the flexibility inherent in the foam allows for flexibility without affecting the insulating properties. The foam is freon free and environmentally friendly. The foam is moulded directly around the carrier pipe, followed by extrusion of the jacket; no spacers are required, therefore thermal bridges are eliminated. The smooth polyethylene (LDPE) jacket is strong and is able to resist any impacts or blows incurred during transport or installation. The jacket pipe is resistant to both high and low temperatures, and is U.V. treated.



PEX

PEX, Double

Steel

Copper

# Heat losses per foot (*meter*) of trench and excavation requirements

## Why use Pex-Flex?

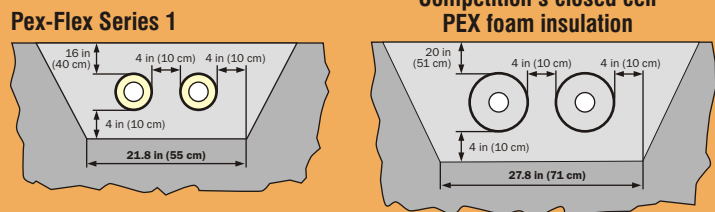
The advantage of using the Pex-Flex system is its remarkable low thermal conductivity. The polyurethane insulation is better than other insulations, resulting in low heat losses and small outer jacket diameters. The benefit of this is outlined in the following tables:

## Operating values

The next three tables compare heat loss between the Pex-Flex insulation and a closed cell PEX foam insulation. The values used in calculating the heat loss are:

- Thermal conductivity of ground  $10.4 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  ( $1.5 \frac{\text{W}}{\text{mK}}$ )
- Coefficient of heat transmission from ground to air  $2 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  ( $0.288 \frac{\text{W}}{\text{mK}}$ )
- Thermal conductivity of Pex-Flex insulation  $0.16 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  ( $0.023 \frac{\text{W}}{\text{mK}}$ )
- Thermal conductivity of other insulation  $0.28 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  ( $0.04 \frac{\text{W}}{\text{mK}}$ )
- Thermal conductivity of the PEX pipe  $2.63 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  ( $0.38 \frac{\text{W}}{\text{mK}}$ )
- Depth of cover: Pex-Flex's higher system compressive strength requires a minimum cover of only 16 in (40 cm) while close cell PEX foam insulation requires 20 in (51 cm).
- Flow temperature  $180^\circ\text{F}$  ( $82^\circ\text{C}$ )
- Return temperature  $140^\circ\text{F}$  ( $60^\circ\text{C}$ )
- Ground temperature  $30^\circ\text{F}$  ( $-1^\circ\text{C}$ )

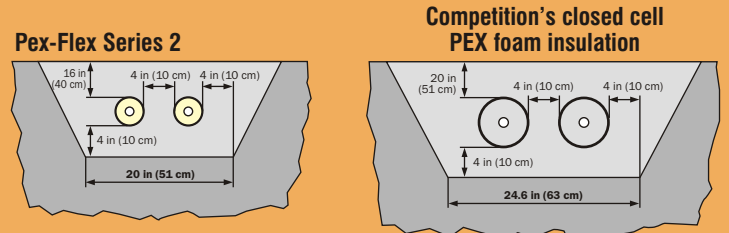
Pex-Flex Series 1			Competition's closed cell PEX foam insulation	
Nominal pipe size in (mm)	Jacket pipe O.D. in (mm)	Heat loss Btu/h ft (W/m)	Jacket pipe O.D. inches (mm)	Heat loss Btu/h ft (W/m)
¾ (25)	3.0 (77)	18.8 (18.1)	5.0 (127)	23 (22.1)
1 (32)	3.0 (77)	24.0 (23.1)	5.0 (127)	25 (24.0)
1¼ (40)	3.5 (90)	25.8 (24.8)	6.3 (160)	25 (24.0)
1½ (50)	4.3 (110)	26.2 (25.2)	6.3 (160)	30 (28.8)
2 (63)	4.9 (125)	29.8 (28.7)	7.9 (200)	36 (34.6)
2½ (75)	5.5 (140)	32.8 (31.5)	7.9 (200)	35 (33.6)
3 (90)	6.3 (160)	35.2 (33.8)	7.9 (200)	42 (40.3)
4 (110)	6.3 (160)	40.5 (38.9)	7.9 (200)	54 (51.8)



**Figure 1** This example shows nominal pipe size of 2 in (63 mm) on all pipes and an outer jacket dimension of 5 in (125 mm) for Pex-Flex and 7.9 in (200 mm) for the closed cell PEX foam insulation

**Remarks:** In this example, excavation cost savings are achieved with Pex-Flex because of its smaller dimensions.

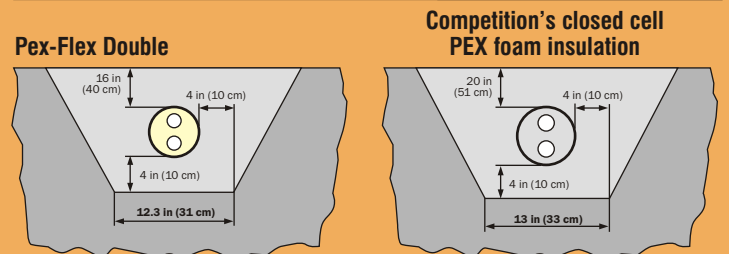
Pex-Flex Series 2			Competition's closed cell PEX foam insulation	
Nominal pipe size in (mm)	Jacket pipe O.D. in (mm)	Heat loss Btu/h ft (W/m)	Jacket pipe O.D. in (mm)	Heat loss Btu/h ft (W/m)
½ (20)	3.0 (77)	15.7 (15.1)	5.0 (127)	20 (19.2)
¾ (25)	3.5 (90)	16.5 (15.9)	5.0 (127)	23 (22.1)
1 (32)	3.5 (90)	20.4 (19.6)	5.0 (127)	25 (24.0)
1¼ (40)	4.3 (110)	20.6 (19.8)	6.3 (160)	25 (24.0)
1½ (50)	4.9 (125)	22.6 (21.7)	6.3 (160)	30 (28.8)
2 (63)	5.5 (140)	25.9 (24.9)	7.9 (200)	36 (34.6)
2½ (75)	6.3 (160)	27.1 (26.1)	7.9 (200)	35 (33.6)



**Figure 2** This example shows a 1½ in (40 mm) pipe and an outer dimension of 4.3 in (110 mm) for Pex-Flex and 6.3 in (160 mm) for closed cell PEX foam insulation.

**Remarks:** It can be seen in this table that even though the Pex-Flex jackets are smaller, the heat losses are equal or lower in all cases.

Pex-Flex Double			Competition's closed cell PEX foam insulation	
Nominal pipe size in (mm)	Jacket pipe O.D. in (mm)	Heat loss Btu/h ft (W/m)	Jacket pipe O.D. in (mm)	Heat loss Btu/h ft (W/m)
2 x ½ (20)	3.5 (90)	12.3 (11.8)	5.0 (127)	16 (15.4)
2 x ¾ (25)	4.3 (110)	12.0 (11.5)	5.0 (127)	19 (18.4)
2 x 1 (32)	4.3 (110)	16.1 (15.5)	6.3 (160)	18 (17.3)
2 x 1¼ (40)	4.9 (125)	18.1 (17.4)	6.3 (160)	23 (22.1)
2 x 1½ (50)	6.3 (160)	16.7 (16.1)	7.9 (200)	20 (19.5)



**Figure 3** This example shows a dimension of 2 x ¾ in (25 mm) on the inner pipe and an outer dimension of 4.3 in (110 mm) for Pex-Flex and 5.0 in (127 mm) for closed cell PEX foam insulation.

**Remarks:** The Pex-Flex Double is a pipe system with a very low heat loss and a small outer pipe diameter. In the above table, the heat loss of the small outer pipe diameter Pex-Flex are equal or better than the larger diameter closed cell PEX foam insulation.

### Steel-Flex pipe

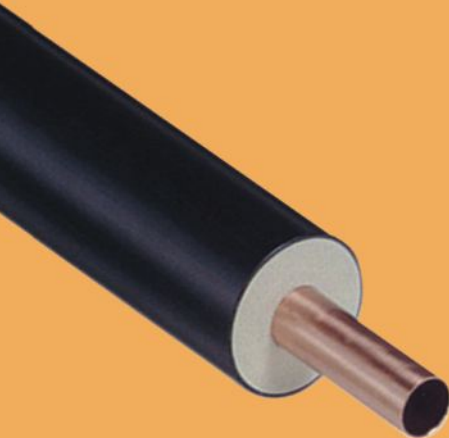


Nominal pipe size in (mm)	Carrier pipe O.D. in (mm)	Carrier pipe wall thickness in (mm)	Jacket pipe O.D. in (mm)	Minimum/Maximum coil length feet (meters)
5/8 (20)	0.79 <b>(20)</b>	0.079 (2.0)	3.0 <b>(77)</b>	164/328 (50/100)
5/8 (20)	0.79 <b>(20)</b>	0.079 (2.0)	3.5 <b>(90)</b>	164/328 (50/100)
3/4 (25)	0.98 <b>(25)</b>	0.079 (2.0)	3.0 <b>(77)</b>	164/328 (50/100)
3/4 (25)	0.98 <b>(25)</b>	0.079 (2.0)	3.5 <b>(90)</b>	164/328 (50/100)
1 (28)	1.10 <b>(28)</b>	0.079 (2.0)	3.0 <b>(77)</b>	164/328 (50/100)
1 (28)	1.10 <b>(28)</b>	0.079 (2.0)	3.5 <b>(90)</b>	164/328 (50/100)

Available only with alarm wire.

n.b.: All sizes are metric, imperial adapters are supplied as required.

### CU-Flex pipe

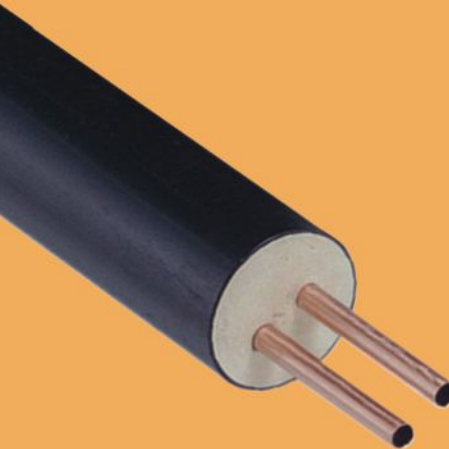


Nominal pipe size in (mm)	Carrier pipe O.D. in (mm)	Carrier pipe wall thickness in (mm)	Jacket pipe O.D. in (mm)	Minimum/Maximum coil length feet (meters)
1/2 (15)	0.59 <b>(15)</b>	0.039 (1.0)	3.0 <b>(77)</b>	164/328 (50/100)
5/8 (18)	0.71 <b>(18)</b>	0.039 (1.0)	3.0 <b>(77)</b>	164/328 (50/100)
3/4 (22)	0.87 <b>(22)</b>	0.039 (1.0)	3.0 <b>(77)</b>	164/328 (50/100)
1 (28)	1.10 <b>(28)</b>	0.047 (1.2)	3.0 <b>(77)</b>	164/328 (50/100)
1 (28)	1.10 <b>(28)</b>	0.047 (1.2)	3.5 <b>(90)</b>	164/328 (50/100)
1 1/4 (35)	1.38 <b>(35)</b>	0.059 (1.5)	3.5 <b>(90)</b>	164/328 (50/100)
1 1/4 (35)	1.38 <b>(35)</b>	0.059 (1.5)	4.3 <b>(110)</b>	164/328 (50/100)

Available only with alarm wire.

n.b.: All sizes are metric, imperial adapters are supplied as required.

### CU-Flex pipe, double



Nominal pipe size in (mm)	Carrier pipe O.D. in (mm)	Carrier pipe wall thickness in (mm)	Jacket pipe O.D. in (mm)	Minimum/Maximum coil length feet (meters)
2 x 5/8 (18)	2 x 0.71 <b>(2 x 18)</b>	0.039 (1.0)	3.5 <b>(90)</b>	164/328 (50/100)
2 x 3/4 (22)	2 x 0.87 <b>(2 x 22)</b>	0.039 (1.0)	3.5 <b>(90)</b>	164/328 (50/100)
2 x 1 (28)	2 x 1.10 <b>(2 x 28)</b>	0.047 (1.2)	4.3 <b>(110)</b>	164/328 (50/100)

Available only with alarm wire.

n.b.: All sizes are metric, imperial adapters are supplied as required.

## Pex-Flex for district heating

Nominal pipe size in (mm)	Carrier pipe O.D. in (mm)	Carrier pipe wall thickness in (mm)	Jacket pipe O.D. in (mm)	Minimum/Maximum coil length feet (meters)	Weight lb/ft (kg/m)
½ (20)	0.79 <b>(20)</b>	0.079 (2.0)	3.0 <b>(77)</b>	164/984 (50/300)	(1.0)
¾ (25)	0.98 <b>(25)</b>	0.098 (2.5)	3.0 <b>(77)</b>	164/984 (50/300)	(1.0)
¾ (25)	0.98 <b>(25)</b>	0.098 (2.5)	3.5 <b>(90)</b>	164/984 (50/300)	(1.1)
1 (32)	1.26 <b>(32)</b>	0.114 (2.9)	3.0 <b>(77)</b>	164/984 (50/300)	(1.0)
1 (32)	1.26 <b>(32)</b>	0.114 (2.9)	3.5 <b>(90)</b>	164/984 (50/300)	(1.6)
1¼ (40)	1.57 <b>(40)</b>	0.145 (3.7)	3.5 <b>(90)</b>	164/984 (50/300)	(1.3)
1¼ (40)	1.57 <b>(40)</b>	0.145 (3.7)	4.3 <b>(110)</b>	164/656 (50/200)	(2.1)
1½ (50)	1.97 <b>(50)</b>	0.181 (4.6)	4.3 <b>(110)</b>	164/656 (50/200)	(1.9)
1½ (50)	1.97 <b>(50)</b>	0.181 (4.6)	5.0 <b>(125)</b>	164/656 (50/200)	(2.9)
2 (63)	2.48 <b>(63)</b>	0.228 (5.8)	5.0 <b>(125)</b>	164/656 (50/200)	(2.4)
2 (63)	2.48 <b>(63)</b>	0.228 (5.8)	5.5 <b>(140)</b>	164/656 (50/200)	(3.7)
2½ (75)	2.95 <b>(75)</b>	0.272 (6.9)	5.5 <b>(140)</b>	164/328 (50/100)	(3.3)
2½ (75)	2.95 <b>(75)</b>	0.272 (6.9)	6.3 <b>(160)</b>	164/328 (50/100)	(4.7)
3 (90)	3.54 <b>(90)</b>	0.323 (8.2)	6.3 <b>(160)</b>	164/328 (50/100)	(4.2)
4 (110)	4.33 <b>(110)</b>	0.393 (10.0)	6.3 <b>(160)</b>	164/328 (50/100)	(5.5)

Besides the above mentioned coil lengths, we can also deliver PEX in fixed lengths of 40 ft (12 m).

n.b.: All sizes are metric, imperial adapters are supplied as required.

## Pex-Flex, double, for district heating

Nominal pipe size in (mm)	Carrier pipe O.D. in (mm)	Carrier pipe wall thickness in (mm)	Jacket pipe O.D. in (mm)	Minimum/Maximum coil length feet (meters)	Weight lb/ft (kg/m)
2 x ½ (20)	2 x 0.79 <b>(2 x 20)</b>	0.079 (2.0)	3.5 <b>(90)</b>	164/984 (50/300)	(1.7)
2 x ¾ (25)	2 x 0.98 <b>(2 x 25)</b>	0.098 (2.5)	4.3 <b>(110)</b>	164/656 (50/200)	(2.1)
2 x 1 (32)	2 x 1.26 <b>(2 x 32)</b>	0.114 (2.9)	4.3 <b>(110)</b>	164/656 (50/200)	(2.2)
2 x 1¼ (40)	2 x 1.57 <b>(2 x 40)</b>	0.145 (3.7)	5.0 <b>(125)</b>	164/656 (50/200)	(2.7)
2 x 1½ (50)	2 x 1.97 <b>(2 x 50)</b>	0.181 (4.6)	6.3 <b>(160)</b>	164/328 (50/100)	(4.1)

Besides the above mentioned coil lengths, we can also deliver PEX in fixed lengths of 40 ft (12 m).

n.b.: All sizes are metric, imperial adapters are supplied as required.

## The general advantages of flexible piping systems are:

- Reduction in the number of joints needed through the availability of long lengths
- Reduction in the number of bends/fittings needed as the flexibility allows the piping to follow the best and easiest path (see minimum bending radius table on page 6).
- Reduction of waste as pipe can be cut to measure
- No special considerations necessary to take up thermal expansion
- Reduction of excavation costs as pipes can be laid on top of each other and/or in very narrow trenches
- No-dig methods (or boring) can be applied
- Polyurethane-cyclopentane foam with a lambda-value of  $0,16 \frac{\text{Btu}\cdot\text{in}}{\text{ft}^2\cdot\text{h}\cdot^\circ\text{F}}$  (0.023 W/m K) measured at 122 °F (50 °C) is the most efficient insulation available.

# Flexible bonded systems

In the solid-foamed flexible systems, the carrier pipe, polyurethane foam and LDPE jacket pipe are bonded together, eliminating the risk of water penetration along the carrier pipe. In operation, the system is held in place by the soil friction. The plastic properties of all types of carrier pipes are utilized to absorb thermal expansion. Consequently, these pipes are self-compensating and expansion need not be considered.

## Temperature and pressure

Pex-Flex has a PEX carrier pipe, intended for temperatures up to 203°F (95°C), while Cu-Flex, with a carrier pipe made of soft annealed copper, can be used up to 266°F (130°C). The PEX carrier pipe features an oxygen diffusion barrier made of EVAL, which ensures that oxygen is not able to diffuse into the water.

Type	Nominal pipe size in	Max. temperature		Max. pressure	
		Fahrenheit	(Celsius)	psi	(bar)
Pex-Flex	1/2 - 4	203°	(95°)	87	(6)
Pex-Flex	1/2 - 4	158°	(70°)	145	(10)
Cu-Flex	1/2 - 1 1/4	266°	(130°)	232	(16)
Steel-Flex	3/4 - 1	266°	(130°)	362	(25)

## Flexible pipes are available in many different lengths

Depending on the dimension, Pex-Flex pipes are supplied in coils of 164-984 ft (50-300 m). Cu-Flex is supplied in coils of 164-328 ft (50-100 m).

Steel-Flex is supplied in coils of 164-328 ft (50-100 m).

Flexible pipes are also available in straight lengths - both Pex-Flex and Cu-Flex, including double pipe in some dimensions. The low weight of the pipes makes them easy to handle.

## Minimum bending radius

Jacket O. D. in (mm)	Min. bending radius feet (meters)
2.6 (66)	2.3 (0.7)
3.0 (77)	2.6 (0.8)
3.5 (90)	3.0 (0.9)
4.3 (110)	3.5 (1.1)
4.9 (125)	4.0 (1.2)
5.5 (140)	4.5 (1.4)
6.3 (160)	5.2 (1.6)
7.0 (180)	5.9 (1.8)

With the minimum bending radius listed above, elbows can normally be avoided.



# Pex-Flex pipe connections

Logstor offers top quality brass compression fittings in a wide variety, such as: T-couplings, reducers, PEX to PEX couplings and PEX to thread-end couplings. When connecting to NPT thread, metric to NPT thread adapters are also offered.

For further information, please contact your local representative.

## Joists and fittings insulation

A complete range of preformed polyurethane insulation foam covers relieved on the inside to accommodate the compression couplers and T-fittings is available. A waterproof seal is accomplished by field installing the supplied heat shrink material.



## Check out WebStaTech - Our online calculation tool.

This free web tool can help you design the ideal pre-insulated pipe system for your specific backyard furnace application. Calculate heat losses, compare insulation and pipe materials, determine energy savings and convert to dollars. Visit [www.logstor.com/webstatech](http://www.logstor.com/webstatech) to register or contact any Urecon office.

Heat loss	
Pipe length	100 ft

Results	
Jacket	4.33 in
Heat transfer coefficient	0.14 Btu/(ft hr°F)
Heat loss	17.9 Btu/(hr ft)
Total heat loss	1793 Btu/hr

System parameters				
Flow temp.	180 °F	Pair of pipes <input checked="" type="radio"/> Double pipe	Media	Water
Return temp.	140 °F	Distance between pipes	Pipe material	LR-Pex
Soil temp.	32 °F		Series	Serie1
Soil cover	16 in		Dimension	2 x 1" (32 mm)

For further information and technical assistance on Logstor's flexible piping systems, please contact any of the following offices:

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[www.urecon.com](http://www.urecon.com)

Logstor is Europe's leading manufacturer of flexible piping systems using PEX, copper or steel carrier pipes. Logstor and Urecon's quality management systems are certified in accordance with ISO-9001: 2000.

The company staff of engineers and technicians is ready to assist in all aspects of project planning, selection of materials and systems, as well as system layout.

Logstor's products are sold in more than 30 countries, with manufacturing facilities in Denmark and Poland.

Urecon is Logstor's agent for Canada, the Americas, the Bahamas and the Caribbean.

Local Agent / Distributor